

AMENDMENTS

In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1-18 (Canceled)

19. (currently amended) A metal structure, comprising:

a semiconductor substrate with a conductor thereon;

an insulating layer overlying the semiconductor substrate having a hole therein exposing

the conductor, wherein the insulating layer comprises USG;

a conductive plug substantially filling the hole and electrically connecting the underlying

conductor, wherein the conductive plug comprises tungsten;

a carbon-doped silicon oxide or carbon and nitrogen-doped silicon oxide, serving as an

adhesion layer, overlying the insulating layer and the conductive plug;

a low dielectric constant layer overlying the carbon-doped silicon oxide or carbon and

nitrogen-doped silicon oxide;

a trench in the low dielectric constant layer and the carbon-doped silicon oxide or carbon

and nitrogen-doped silicon oxide; and

a copper or copper alloy conductor substantially filling the trench, electrically connecting

the conductive plug.

20. (original) The structure as claimed in claim 19, wherein the conductive plug comprises tungsten.

21. (original) The structure as claimed in claim 19, wherein the conductor comprises metal silicide.

22. (original) The structure as claimed in claim 19, wherein the semiconductor substrate comprises silicon germanium.

23. (original) The structure as claimed in claim 19, wherein the conductor is composed of doped semiconductor, polysilicon, metal, metal compound or a combination thereof.

24. (original) The structure as claimed in claim 19, wherein the insulating layer comprises undoped silicate glass (USG).

25. (previously presented) The structure as claimed in claim 19, wherein the thickness of the carbon-doped silicon oxide or carbon and nitrogen-doped silicon oxide is less than 500 Å.

26. (canceled)

27. (previously presented) The structure as claimed in claim 19, wherein the carbon content of the previously exceeds 20%.

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28. (original) The structure as claimed in claim 19, wherein the dielectric constant (k) of the low dielectric constant layer is less than 3.0.

29. (original) The structure as claimed in claim 19, wherein the low dielectric constant layer is formed by chemical vapor deposition (CVD) and/or Spin-On method.

30. (original) The structure as claimed in claim 19, wherein the low dielectric constant layer comprises inorganic film and/or organic film.

31. (previously presented) The structure as claimed in claim 19, wherein previously less than 950Å.

32. (previously presented) The structure as claimed in claim 19, wherein the trench is having a width of less than 1300Å.

33. (previously presented) The structure as claimed in claim 19, wherein the structure further comprises a Ta and/or TaN lining layer.

34. (currently amended) A metal structure, comprising:
a semiconductor substrate with a conductor comprising nickel silicide thereon;
an insulating layer overlying the semiconductor substrate having a hole therein exposing
the conductor, wherein the insulating layer comprises USG;

a conductive plug substantially filling the hole and electrically connecting the underlying conductor, wherein the conductive plug comprises tungsten;

a carbon-doped silicon oxide or carbon and nitrogen-doped silicon oxide, serving as an adhesion layer, overlying the insulating layer and the conductive plug;

a low dielectric constant layer overlying the carbon-doped silicon oxide or carbon and nitrogen-doped silicon oxide;

a trench in the low dielectric constant layer and the carbon-doped silicon oxide or carbon and nitrogen-doped silicon oxide;

a diffusion layer lining the trench; and

a copper or copper alloy conductor substantially filling the trench, electrically connecting the conductive plug.

35. (original) The structure as claimed in claim 34, wherein the conductive plug comprises tungsten.

36. (previously presented) The structure as claimed in claim 34, wherein the thickness of the carbon-doped silicon oxide or carbon and nitrogen-doped silicon oxide is less than 500 Å.

37. (previously presented) The structure as claimed in claim 34, wherein the carbon content of the carbon-doped silicon oxide or carbon and nitrogen-doped silicon oxide exceeds 20%.

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38. (original) The structure as claimed in claim 34, wherein the dielectric constant (k) of the low dielectric constant layer is less than 3.0.

39. (previously presented) The structure as claimed in claim 34, wherein the hole is having a width of less than 950Å.

40. (previously presented) The structure as claimed in claim 34, wherein the trench is having a width of less than 1300Å.

41. (previously presented) The structure as claimed in claim 34, wherein the diffusion layer comprises Ta and/or TaN.

42. (currently amended) A metal structure, comprising:
a semiconductor substrate with a conductor thereon;
an insulating layer overlying the semiconductor substrate having a hole therein exposing
the conductor, wherein the insulating layer comprises USG;
a conductive plug substantially filling the hole and electrically connecting the underlying
conductor, wherein the conductive plug comprises tungsten;
a carbon-doped silicon oxide or carbon and nitrogen-doped silicon oxide, serving as an
adhesion layer, overlying the insulating layer and the conductive plug;
a low dielectric constant layer overlying the carbon-doped silicon oxide or carbon and
nitrogen-doped silicon oxide;

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a trench in the low dielectric constant layer and the carbon-doped silicon oxide or carbon
and nitrogen-doped silicon oxide;
a diffusion layer lining the trench; and
a copper or copper alloy conductor substantially filling the trench, electrically connecting
the conductive plug.